Abstract Submitted
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Magnetization studies and spin Hamiltonian modelling of Li2(Li1-xFex)N[1] JAMES H. ATKINSON, Department of Physics, University of Central Florida, Orlando, FL, USA, ANTON JESCHE, The Ames Laboratory, Iowa State University, Ames, Iowa, USA, and the Institute for Physics, University of Augsburg, Augsburg, Germany, ENRIQUE DEL BARCO, Department of Physics, University of Central Florida, Orlando, FL, USA, PAUL C. CANFIELD, The Ames Laboratory, Iowa State University, Ames, Iowa, USA — The study of ferromagnetic materials has yielded many examples of compounds which exhibit large energy barriers to a reversal of magnetization and correspondingly wide magnetization versus field hysteresis loops. Some materials, such as members of the class called "single-molecule magnets" (SMMs), even display vivid signatures of quantum tunneling effects, manifested as step-like features in hysteresis loop measurements of crystalline ensembles. The compound Li2(Li1-xFex)N has been previously shown to display an extremely high blocking temperature ($\sim$ 20 K) and large coercive fields (>11 T), as well as step-like features like those seen in SMMs [1]. Here we report the results of low-temperature Hall sensor magnetization studies on a crystalline sample of Li2(Li1-0.006Fe0.006)N in which we detail evidence of a preferential orientation for the observed features, as well as their dependence upon transverse component fields in their magnitude, behavior which we attempt to model with a giant spin Hamiltonian. [1] A. Jesche, R.W. McCallum, S. Thimmaiah, J.L. Jacobs, V. Taufour, A. Kreyssig, R.S. Houk, S.L. Bud'ko & P.C. Canfield. Nature Comm., 5, 3333 (2014).

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